2010 Alaska Bridge Report

Kuskulana River Bridge, McCarthy Road

Alaska Department of Transportation and Public Facilities

March 2011

Table of Contents

The mission of the Department of Transportation and Public Facilities is to provide for the safe and efficient movement of people and goods and the delivery of state services

The annual Alaska Bridge Report was produced by the Alaska Department of Transportation and Public Facilities in Juneau, Alaska, at a cost of $8.07 per copy.

Introduction

Alaska bridges are in overall good condition. Department engineers inspect about 500 public bridges per year, regardless of ownership, to spot problems, and engage in a corrective work program that assures Alaska bridges are safe. Bridge inspection and remediation is ongoing and will always face challenges. About one-third of the bridges in the state are past the mid-point of their 75-year design life. Industrial development, including mining and oil or gas field development and future construction of oil or natural gas pipelines, may require rehabilitation and replacement of existing bridges to carry the significant traffic loads such development generates. Population growth and increased traffic volumes also place higher demands on bridge inventory.

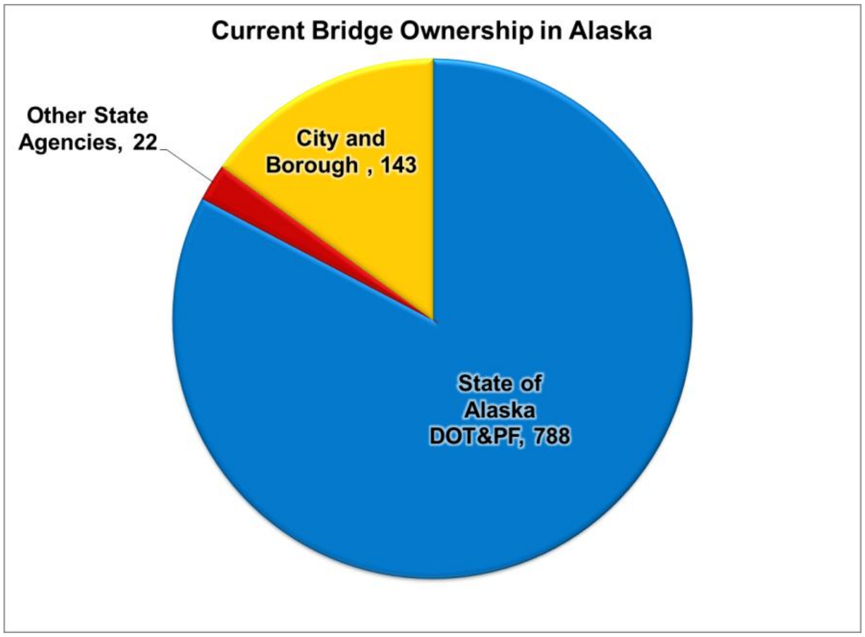


Figure 1. Bridge Ownership

The Federal Highway Administration (FHWA) funds almost all bridge rehabilitation and replacement through the Highway Bridge Program and other highway funding sources. As this report reveals, this source is no longer sufficient to meet all of Alaska's bridge needs in the future. The safety of the traveling public, and the vital role played by the highway system in business, industry and society depends on the inspection, preservation and maintenance of the state's bridge inventory.

The Alaska Department of Transportation and Public Facilities is responsible for inspecting 953 bridges on publicly-owned roads in Alaska under requirements established by the FHWA.

These include 788 bridges owned by the Department, 22 owned by other state agencies, and 143 owned by cities and boroughs. Federal agencies inspect bridges under their jurisdiction, while the Alaska Railroad Corporation inspects bridges on the rail system. This report addresses all bridges for which the Department has inspection responsibility, but focuses on the 788 bridges owned and operated by the Department. The federally funded bridge inspection program does not apply to pedestrian and bicycle bridges, even if within the road right-of-way; these bridges must be inspected and periodically rehabilitated or replaced using another source of funding.

Bridge Rating

The FHWA has established national standards for the structural condition of bridges in the *Recording and Coding Guide for the Structure Inventory and Appraisal of the Nation's Bridges*. The FHWA has developed standards and methods to determine whether a bridge is "structurally deficient" (deteriorating), or "functionally obsolete" (out-of-date design). The FHWA bases these classifications on evaluation of the bridge deck (the driving surface); the bridge superstructure (the components of the bridge supporting the deck such as the girders); and the bridge substructure (the components of the bridge below the superstructure such as the abutments and piers).

Structurally Deficient. A bridge is structurally deficient if inspection reveals that primary load-carrying elements are in poor (or worse) condition due to deterioration and/or damage. Likewise, a bridge is structurally deficient if the adequacy of the waterway opening provided by the bridge is determined to be extremely insufficient to the point of causing intolerable traffic interruptions (for example, water spills over the roadway). A structurally deficient rating does not mean that a bridge is likely to collapse or that it is necessarily unsafe.

Functionally Obsolete. A bridge that does not meet the current design standards (for example, for lane width, number of lanes, shoulder widths, vertical clearances or load capacity, presence of guardrails on the approaches) is functionally obsolete. While structural deficiencies typically result from deterioration of the bridge components, functional obsolescence generally results from changing traffic demands on the structure. Bridges conform to the design standards in place at the time they are constructed. The degree of difference between current design standards, and those in place for a bridge constructed at a prior time, determines whether a bridge receives a functionally obsolete classification.

While the terms "structurally deficient" and "functionally obsolete" can imply unsafe conditions, bridges with these classifications are in safe operating condition to meet the required level of service, or they are weight-restricted or lane-restricted (reduced to a single lane) to assure safe operation.

The two graphs below shows the total number of structurally deficient and functionally obsolete bridges in the state by year from 2000 to 2010. Figure 2 shows DOT bridges only, while Figure 3 shows DOT-owned bridges as well as bridges owned locally and by other state agencies.

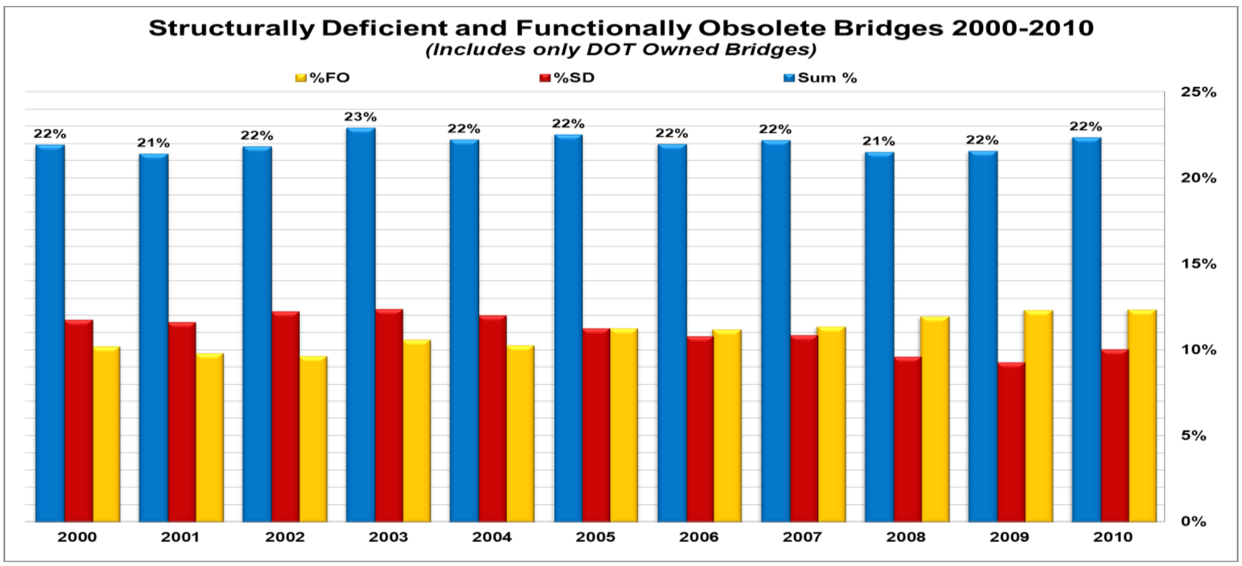


Figure 2. Structurally Deficient and Functionally Obsolete Bridges DOT-Owned Only

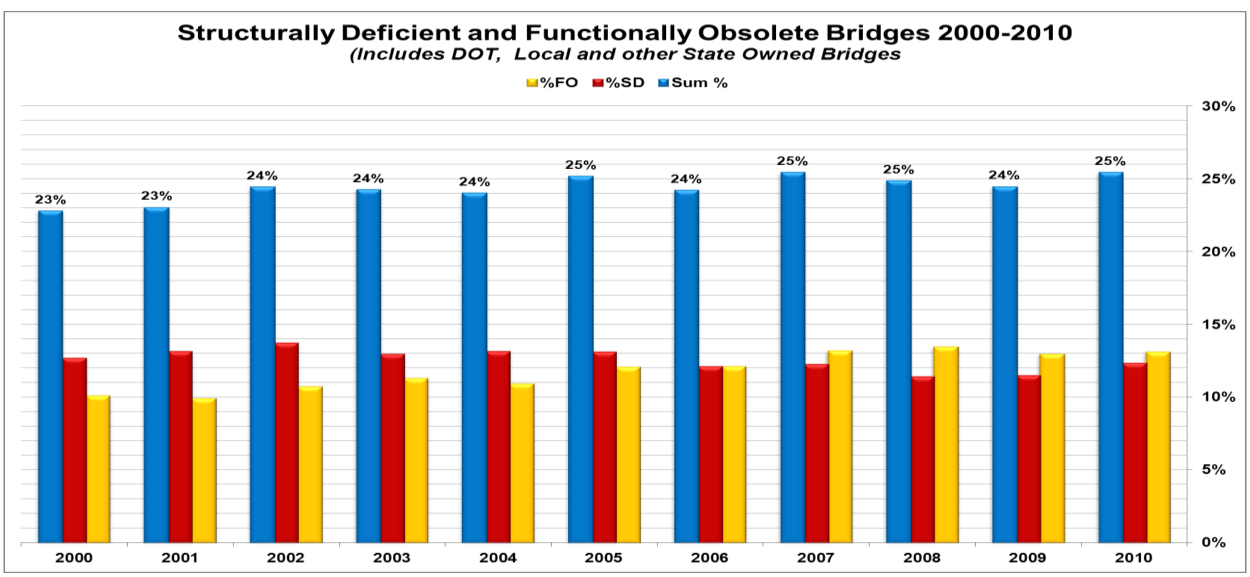


Figure 3. Structurally Deficient and Functionally Obsolete Bridges DOT and Other

The Department evaluates bridges using FHWA numerical rating formulas that indicate a bridge's condition and its sufficiency.

Condition Rating. The condition rating describes the existing, in-place status of a bridge component such as the deck, superstructure or substructure, compared to the bridge's original, or as-new, condition using a '0' to '9' scale, 9 equaling excellent and 0 equaling failed. Bridge inspectors assign condition ratings by evaluating the severity of the deterioration of individual bridge components and the extent to which it affects the component being rated.

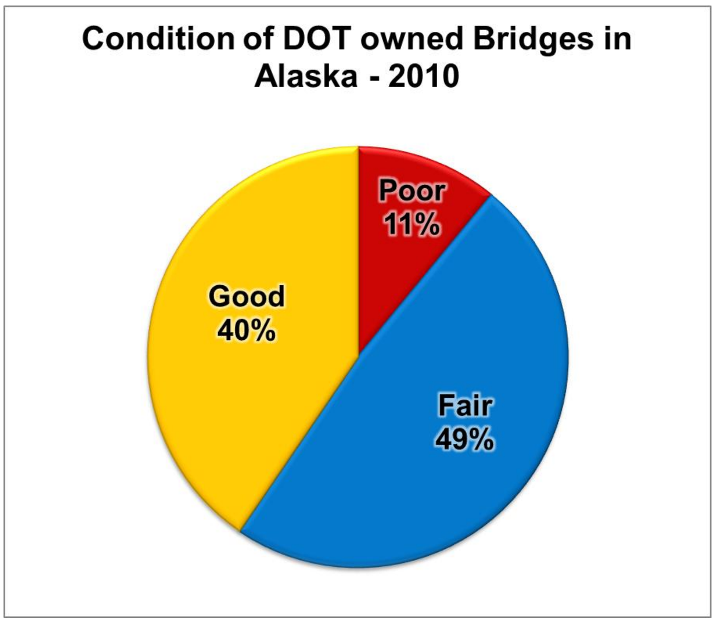


Figure 4. Condition of DOT-Owned Bridges

Using numerical rankings from the condition rating (7-9=good; 5-6=fair; 0-4=poor), Department engineers classify the condition of Alaska bridges as good, fair, or poor condition. Bridges in the good-condition category are in excellent or very good condition or may have minor problems that can be addressed with preservation or maintenance practices. Bridges in the fair-condition category are structurally sound, but show minor deterioration, cracking, spalling or scour that can be corrected through repair. Bridges in the poor-condition category show advanced deterioration, may not be structurally sound, are candidates for rehabilitation or replacement, and may require weight or lane restrictions.

The Department annually calculates the deck area of structurally deficient bridges. The graph below shows the square footage of deck area of structurally deficient bridges by year from

2001 to 2010 for Alaska bridges owned by DOT and for bridges owned by local and other state agencies. The 2010 inspection year disclosed several additional bridges with structural deficiencies, causing an increase in structurally deficient deck area.

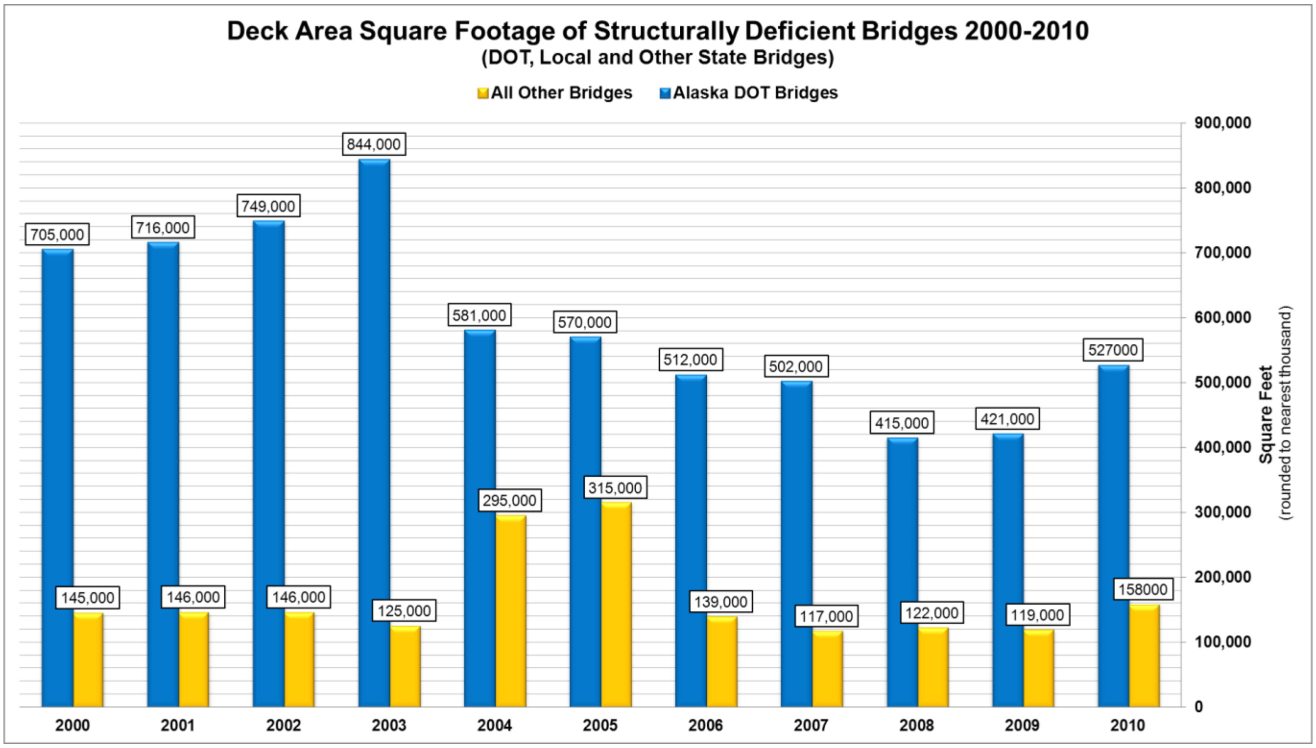


Figure 5. Deck Area Square Footage of Structurally Deficient Bridges by Year, DOT and Other Local and State Agencies

DOT-owned bridges have seen a 36% reduction in the deck area of structurally deficient bridges since 2003 when the metric was at a high point. Based on planned bridge construction, the Department anticipates that bridges currently programmed in the STIP for rehabilitation and replacement will improve this statistic even further (see Appendix C for a list of these bridges).

The examples that follow show how the amounts in Figure 5 can change from year-to-year. Recent replacement of the Tanana River Bridge and the Gakona River Bridge, and near-complete rehabilitation of the Ketchikan Water Street Viaduct lower the 2010 deck area square footage of structurally deficient bridges by almost 117,000 square feet, from 527,000 square feet in 2010 to a projected 410,000 square feet in 2011. At the same time, other bridges will continue to age, adding an unknown amount of deck area to the structurally deficient total.

Sufficiency Rating. The FHWA bases funding for bridge rehabilitation and replacement on the sufficiency rating. This is a combined numerical rating formula based on structural adequacy and safety, serviceability and functional obsolescence, and essential importance for public use. The result of the formula is a percentage in which 100% represents an entirely sufficient bridge, and 0 represents an entirely deficient bridge.

To qualify for federal bridge replacement funds, a bridge must have a sufficiency rating of 49 or below and to qualify for federal bridge rehabilitation funding, a bridge must have a sufficiency rating of 79 or below. Bridges rated 80 -100 do not qualify for federal bridge rehabilitation or replacement funds, but are eligible for private, state and other federal funding.

Bridge Program

The bridge program comprises a group of activities from maintenance, preservation and design, to inspection and seismic monitoring and retrofitting, meant to build and preserve a safe, functional inventory. Bridge inspection is a crucial component of the program.

Maintenance. This includes ongoing tasks such as replacement of deteriorated bridge elements caused by rusting or spalling (flaking or crumbing concrete), overlaying damaged bridge decks, restoration of guardrails on the bridge approaches, or repairing or replacing faulty expansion joints. The Department's bridge crews conduct an annual preventive maintenance program.

Figure 6. Deteriorating Concrete Trail River Bridge

Preservation. Bridge preservation comprises the Department's pro-active efforts to keep bridges safe and operational. Distinguished from maintenance, preservation comprises work that aims to extend bridge service life and forestall the need for more corrective, reactive maintenance, and includes activities such as painting, cleaning joints to prevent deterioration and/or failure and sealing surfaces to prevent water penetration.

Design. Design is an important component of bridge preservation that accounts for environmental conditions, traffic volumes, vehicle weight and other factors, and helps to assure longer bridge life, greater ease of routine maintenance and greater safety. The Department is currently preparing a bridge manual that emphasizes design as a means of assuring bridge safety and service life.

Figure 7. Re-Decking the Anchor River Bridge

Scour Monitoring and Retrofit. The most common cause of bridge failures is from floods scouring bed material from around bridge foundations. “Scour” is the engineering term for the erosion caused by water removing the material surrounding a bridge foundation (the piers and abutments). Bridges that are structurally vulnerable to scour are termed “scour-critical”.

National Bridge Inspection Standards (23 CFR 650) require states to identify scour critical bridges and to prepare a plan of action to monitor scour conditions and to address potential deficiencies and critical findings. Bridge scour countermeasures may include increased inspection frequencies, the installation of active monitoring systems, and structural improvements to resist scour.

Figure 8. Active Scour Monitoring on the Tonsina River

The Department has identified 113 “scour-critical” bridges in Alaska and is actively evaluating others for scour vulnerabilities. DOT engineers inspect all state-owned scour-critical bridges annually, rather than the 24-month cycle used for routine bridge inspections. Nineteen bridges feature remote scour monitoring systems that provide near real-time scour data at a bridge pier(s). The Department has also collaborated with other agencies, notably the U.S. Geological Survey, to conduct complex scour and bridge hydraulics studies at selected bridges.

Figure 9. Example of Extreme Scouring at Liberty Falls Bridge, Chitina Campground

Seismic Bridge Retrofit. Alaska is the most seismically active state in the union. The Department has implemented a seismic retrofit program for Alaska bridges since the mid-1990s using seismic hazard data from the U.S. Geological Survey. This data, together with a seismic vulnerability assessment of Alaska bridges and a determination of priority highway routes, has resulted in retrofits of up to 20 or more bridges per year, modifying them to withstand earthquakes.

Consistent with national standards adopted by AASHTO (American Association of State Highway Traffic Officials), the Department retrofits bridges to prevent collapse during an earthquake, with public safety the foremost consideration. The Department designs new bridges to the "no collapse" standard contained in the current AASHTO specifications.

Figure 10. Seismic Retrofit using Friction Pendulum Bridge Bearings, Kodiak Harbor Channel Bridge

Inspection. Regular inspection of the state's bridges provides up-to-date information on their physical condition, ensures public safety, and provides a factual basis for public investment in bridge preservation, replacement, and rehabilitation. Federal regulations mandate bridge inspections on a 24-month interval for the accessible portions of the bridge, and on a 60-month rotation for the underwater portion of bridges.

Figure 11. Contract Dive Inspector at the Kenai River Bridge

The state's bridge inspection program seeks compliance with the National Bridge Inspection Standards, to assure high-quality inspections. Bridge inspections can range from routine to in-depth, depending on a bridge's individual characteristics and needs. The Department uses its bridge design engineers as inspectors, giving the design group valuable information on bridge conditions and performance based on use, "wear and tear" and other factors.

Figure 12. Bridge Inspection at Hurricane Gulch

Engineers may inspect smaller bridges on foot, while others require the use of a special "reach-all" vehicle with a jointed arm and bucket that allows access to otherwise unreachable locations. The length and size of a bridge, weather conditions, and location on the road system can vary the length of an inspection from an hour to as much as several days.

DOT inspects approximately 500 bridges per year. Inspectors enter data into PONTIS, an FHWA-approved bridge management system that stores inspection data for each of the structural elements examined. Forty-five state transportation departments in the United States use the PONTIS program.

Alaska traffic volumes are low by national standards, making traffic-generated deterioration a less significant factor in Alaska than in other states. Additional factors affecting Alaska bridges include age, rot and related deterioration of timber bridges, vehicle collisions that can sometimes result in structural damage, scour and overweight loads.

A bridge closure or posting of reduced load capacity typically occurs when advanced deterioration or impact damage reduces structural capacity below state legal loads. Regular inspections typically spot problems in time for implementation of corrective measures, making closure a last option. Currently, two DOT-owned bridges are closed to traffic, both on local roads. An additional fifty-three DOT-owned bridges have load and/or lane (ie, one-way traffic) restrictions (a number that includes eight seaplane float ramps). Three of these bridges are scheduled for replacement, and almost all the rest are on (relatively) low-volume rural or local routes.

Figure 13. Bridge Railing Damaged by a Vehicle Collision

Bridge Age and Construction Materials

The state's bridge inventory continues to age. As of November 2010, 50% of publicly owned bridges in the state are 33 years or older and 10% are more than 50 years old. This indicates

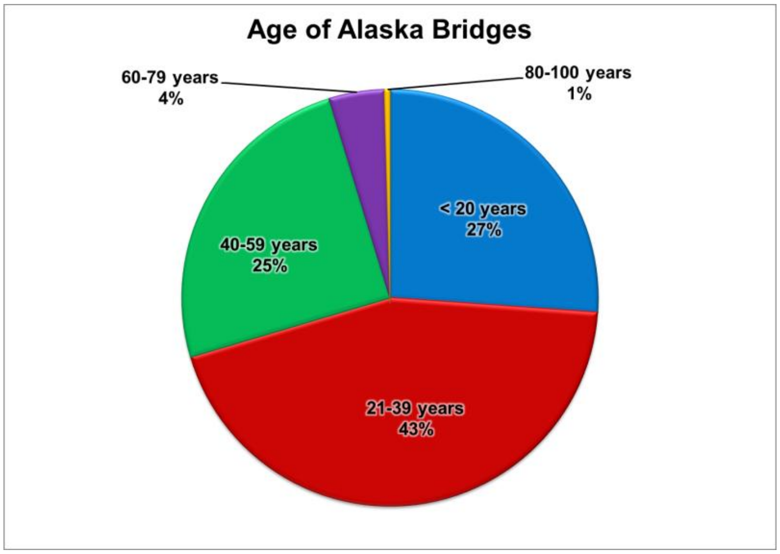


Figure 13. Age of Alaska Bridges

that about one-third of the publicly owned bridges in the state are past the mid-point of their 50-75-year design life. Thus, it is critical to address the existing inventory of structurally deficient bridges, as over time, additional bridges are likely to show signs of distress as they age.

The majority of publicly owned bridges in Alaska have been constructed using steel, followed by pre-stressed concrete bridges, then timber bridges, which typically comprise the older and shorter spans. Because of their relatively low maintenance requirements and relatively low cost, pre-stressed concrete girders are the preferred choice for new construction. See Figure 14 for bridges classified by construction material.

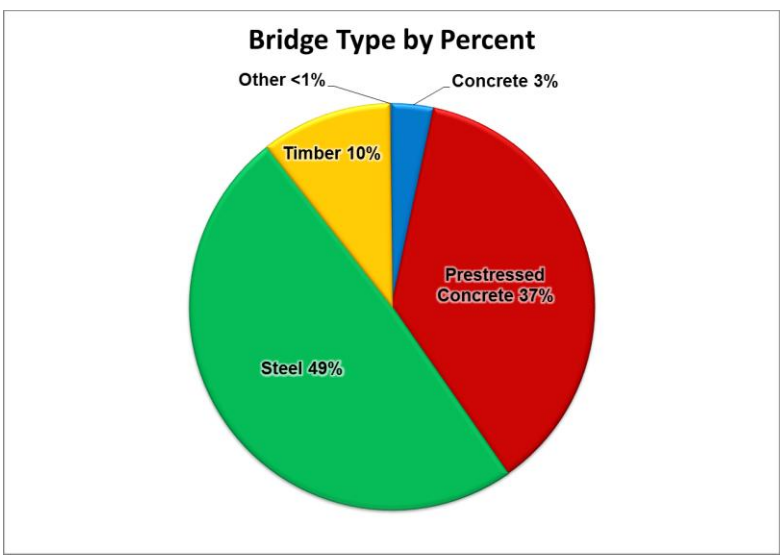


Figure 14. Bridge Construction Material

Schedule and Funding

Schedule of Improvements. As of October, 2010, seventy-nine DOT-owned bridges were classified by DOT bridge engineers as structurally-deficient (See Appendix B). The STIP, or Statewide Transportation Improvement Plan, has identified thirty-one of these bridges for replacement or rehabilitation between 2010 and 2013. Several of these projects, the Gustavus Causeway (replacement), Ketchikan Viaducts (rehabilitation), and replacement bridges on the Tanana and Gakona Rivers, are substantially complete and open for use. A list of structurally deficient bridges scheduled for replacement or rehabilitation in the 2010-2013 STIP is in Appendix C.

Thirty-two bridges were replaced or rehabilitated between 2007 and 2009, and an additional seventeen bridge rehabilitation and replacement projects have been bid and are scheduled for completion in 2010 and 2011 (included among those listed in the STIP). Three of the bridges addressed between 2007 and 2009 -the Trail River Bridge (#610), the Falls Creek Bridge (#609) and the Ptarmigan Creek Bridge (#608)- are temporary detour structures- and are also identified in the 2010-2013 STIP for permanent replacement.

Historically, bridge rehabilitation and replacement has occurred in connection with highway improvement projects; however, recent national attention to bridge conditions has resulted in increased funding for 'stand-alone' bridge projects. One of the factors leading to this shift in strategy in Alaska is the need to improve the state's infrastructure for support of energy and resource development, together with the recognition that the backlog of deficient bridges was growing too rapidly and required a greater emphasis on bridge rehabilitation and replacement.

Figure 15. New and Old Tanana River Bridges

Bridge Replacement and Rehabilitation Planning. The STIP has identified $48,900,000 in funding between 2010 and 2013 for inspection, rehabilitation and replacement of bridges eligible for federal highway bridge program funding. Bridge rehabilitation and replacement comes primarily from the FHWA, but also from other fund sources including federal earmarks, state general fund appropriations and state general obligation bonds.

Bridge replacement projects, once authorized, can take a significant number of years to complete and to count toward a reduction in structural deficiency. The Tanana River Bridge on the Alaska Highway, completed in 2010, illustrates this fact. Despite being a high priority, and with several special steps taken to accelerate the project, the timeline below documents a seven-year effort before the bridge could be included in a measurement of satisfactory structural condition.

	Development Timeline: Tanana River Bridge
2004	First budgeted for design
2008	NEPA Environmental Assessment approved
2008	Design approved and federal funding for construction approved
2009	Construction begins
2010	Construction ends, open to traffic
2011	Inspected and data placed on inventory in 2011

The lengthy timeframe resulted from environmental factors such as fisheries, wetlands, archeological sites and wildlife corridors, as well as the fact that the bridge was constructed during World War II, and as an historic structure, underwent a lengthy historic analysis. The federal-aid process using federal funding is also a factor that contributes to project duration.

Future Funding Needs. While the STIP has identified $48,900,000 in funding between 2010 and 2013 for inspection, rehabilitation and replacement of bridges eligible for federal highway bridge program funding, the actual level of funding required to address bridge conditions in the state is greater.

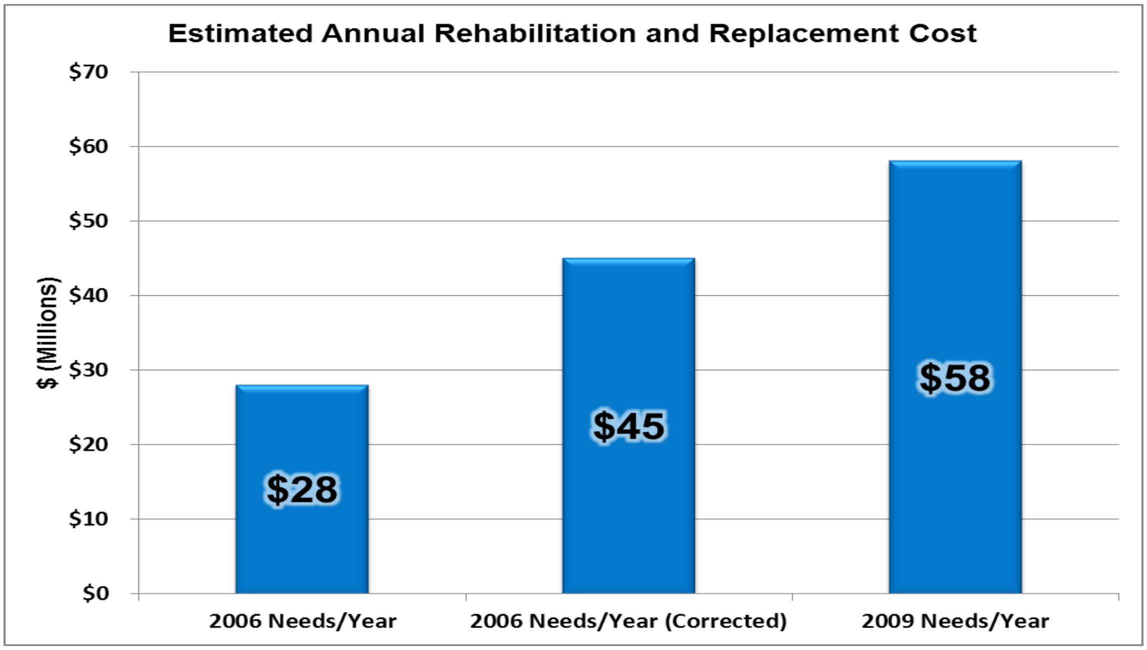


Figure 16. Long-Range Transportation Plan Data Refresh December 3, 2010
Source: Long-Range Transportation Plan Data Refresh, Dye Management, December 3, 2010

The funding level for bridges established in the Statewide Long-Range Transportation Policy Plan, based on data updated in 2010, shows the need for an annual investment of $58 million per year over the next twenty years to achieve the lifecycle management goals of the plan. This figure is greater than the $45 million in annual expenditures identified in the Plan in 2006 as corrected, and significantly greater than the $28 million originally forecast. See Figure 16.

DOT has few options for meeting this identified need. The Department can hope that additional programmatic funding for bridges above current levels will be available at the federal level, or that the congressional delegation earmarks additional funds for bridge rehabilitation and replacement. It can request additional state General Funds on a sustained basis until the need is met, or increase the commitment to bridge work in the Statewide Transportation Improvement Plan, but at the expense of other federally-funded projects. With Congress and the FHWA pressing for a more rigorous asset management approach from each state, it is likely that a sustained and higher level of funding must be found to ensure bridges are kept at an overall good condition.

The Alaska Factors

Lack of Redundancy in the Highway System. It is vital to maintain the bridges that link Alaska's surface transportation routes. Unlike other states, Alaska does not have a high degree of redundancy, or alternate routing, in its highway system. If critical bridges are out of service, depending on location it can result in severe constraints in the movement of goods and people. This heightens the importance of bridge inspections and the related investments that help maintain a highly functioning surface transportation system.

Figure 17. New and Old Gustavus Causeway

Natural Resource Development. Energy and metal price increases are providing a renewed focus on the constraints of existing bridges and their ability to handle large module and construction loads for the energy and resource development industries. Bridges on major NHS routes that provide the corridors to these developments cannot be the limiting factors within the highway infrastructure. Many of these bridges are reaching the end of their design life, are either structurally deficient or functionally obsolete and need to be replaced or reconstructed to meet current use needs. A list of the bridges on the major National Highway System routes undergoing replacement, reconstruction, or re-evaluation is in Appendix E.

Environmental Factors. Alaska's environment presents unique conditions. Freeze-thaw cycles, coastal storms, melting permafrost, harsh winter conditions, the high potential for earthquakes, all pose challenges to bridge designers, to the engineers charged with bridge inspection and preservation, and to the maintenance crews. Also, due to widespread steep terrain along many high-velocity rivers and streams, scour of bridge foundations is more prevalent in Alaska than in many other states.

Specialized Structures. Significant travel occurs in the state via the state ferry system and by seaplane. The state's ferry vessels link to the uplands at state ferry terminals with ramps that the FHWA classifies as bridges in the National Bridge Inventory System (NBIS). The FHWA classifies these specialized structures as functionally obsolete because they handle only one-way traffic at low speeds; however, they are well suited to their intended purpose and are safe to use.

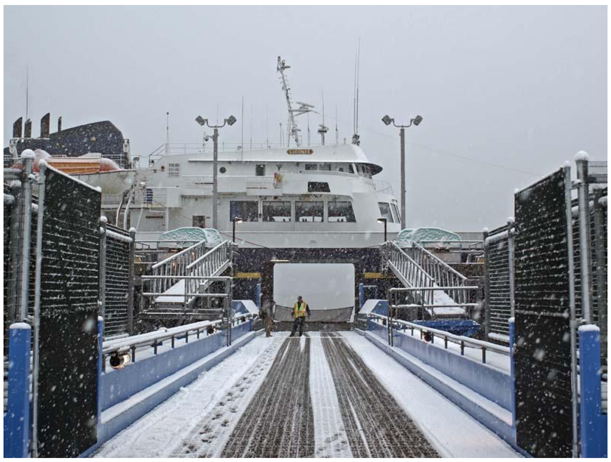


Figure 18. Ferry Terminal Ramp

Figure 19. Hoonah Seaplane Float Ramp

Likewise, many seaplane floats in the state have drive-down ramps for delivering freight, passengers and luggage directly to the aircraft. These ramps, also in the NBIS, are not designed to FHWA bridge standards as they are usually one-lane wide, handle low volumes of traffic and only accommodate light-duty vehicles such as vans and pick-up trucks. Discussions with the FHWA may lead to de-listing seaplane float ramps from the NBIS. However de-listing would mean that another funding source is needed to keep up with inspections and rehabilitation or replacement needs.

Inclusion of these specialized structures in the NBIS results in their classification as functionally obsolete, despite their high suitability for their intended purpose. It demonstrates that broad national indicators of infrastructure condition, such as the NBIS rating system, can misstate actual conditions.

Short Inspection Season. The Department conducts bridge inspections seasonally between April and September. The short inspection season, along with a vast geographic area and many bridges located in rural and remote areas, places unique demands on the program. Notwithstanding, DOT engineers inspect an average of 500 bridges per year.

Closing

An effective bridge design, inspection and management program is essential for the security of the traveling public, and for the social, commercial and economic welfare of the state. As limited federal dollars cover growing infrastructure needs, partnerships will become increasingly important for the implementation of the state's highway program, including rehabilitation, replacement and construction of the state's bridges. Industry, government at the federal, state and local levels, DOT leadership together with staff on the "front lines", and the Legislature, must build relationships that foster success and the wise and efficient use of available funds.

To ensure the long-term reliability of the highway system overall, additional funding for bridge related work is vital. Some states, such as Oregon, have made bridges a key priority and brought significant state resources to that effort.

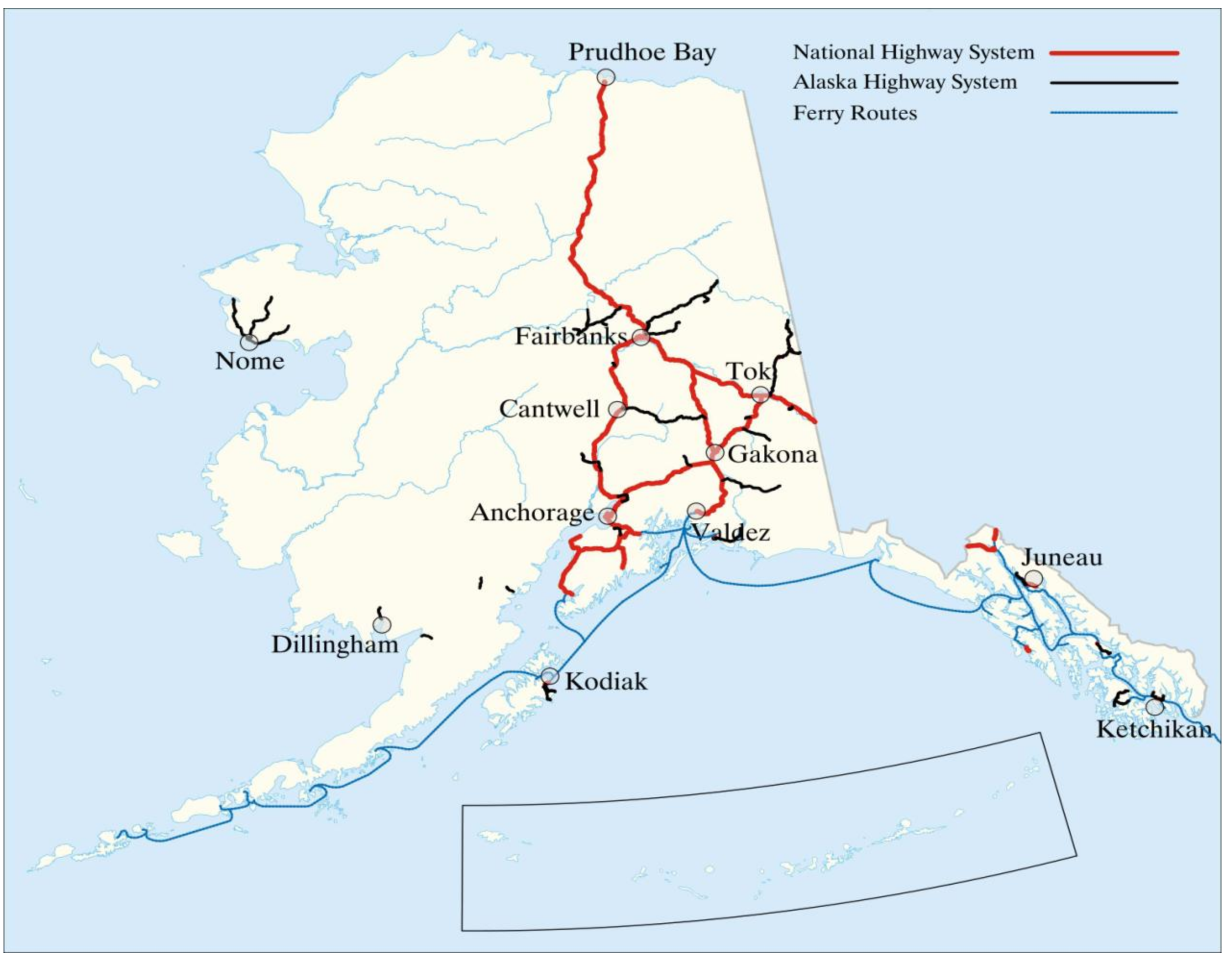


Figure 20. State Highway System Map

Appendix A: Glossary of Terms

Asset Management. A systematic, cost-effective process of maintaining, upgrading and operating physical assets.

National Bridge Inspection Standards (NBIS). These are the federal regulations that establish the requirements for inspection procedures, frequency of inspections, qualifications of inspectors, inspection reports, and maintenance of the state's bridge inventory. The NBIS applies to all bridges longer than 20 feet on public roads.

National Bridge Inventory. Structural inventory and rating information collected to fulfill the requirements of the NBIS.

Off-System Bridge. This is a bridge that is off the federal-aid system. However, as part of the Highway Bridge Program (HBP), States are required to expend not less than 15 percent of the amount apportioned . . . each fiscal year for eligible projects on bridges located off the Federal-aid highway system, unless the State has inadequate needs to justify the expenditure. Typically, but not always, these are city and/or borough-owned bridges.

On-System Bridge. This is a bridge that is on the federal-aid system and qualifies for federal program funding through the FHWA. Typically, but not always, these bridges are state-owned.

Rehabilitation. Bridge improvements that exceed bridge preservation and regular maintenance activities, and which include retrofitting or replacing decking and/or structural elements.

Scour. Erosion caused when floodwaters or swiftly flowing waters wash away sand, gravel and/or rocks away from bridge foundations. It is one of the three main causes of bridge failure in the country and a significant maintenance concern in Alaska, where floodwaters can pose significant risks.

Spalling. Concrete that breaks up, flakes or becomes pitted. This is often the result of environmental factors such as freezing and thawing that stress and damage the concrete. On a low level, concrete spalling can be purely cosmetic in nature. However, it can also result in structural damage when the reinforcing steel (rebar) inside the concrete becomes exposed.

STIP: Statewide Transportation Improvement Program. The STIP is the Department's federally mandated plan for initiating federal aid highway projects. Projects must be included in the STIP and approved by the FHWA (and, in the case of urban projects, the Federal Transit Administration), before development authorization is granted. The STIP is a dynamic document, with regular revisions.

Appendix B: Structurally Deficient DOT Bridges October 2010

Bridge/Number	Route	Deck Area	Priority	Status
Trail River-610*	Seward Highway	9,355 SF	2	Design
Peterson Creek-383*	Dotson Landing Rd	2,553	3	Planning
Ptarmigan Creek-608*	Seward Highway	4,037	4	Design
Falls Creek-609*	Seward Highway	3,374	5	Design
No Name Creek -327	Halibut Point Rd	2,415	6	Design
Virgin Creek-638	Seward Highway	4,158	7	Design
Livengood Creek-229*	Old Elliott Hwy	505	8	Design
Banner Creek-526	Richardson Hwy	1,371	9	Planning
Tulsona Creek-1250	Richardson Hwy	3,150	10	Design
Slana River-654	Tok Cutoff Hwy	6,370	11	Design
Tok River-663	Tok Cutoff Hwy	8,228	12	Design
Hyder Dock Trestle-1238	Salmon River Rd	15,222	13	Construction
Twenty Mile River-634	Seward highway	19,191	14	Design
S. Fork Anchor River-666	Sterling River	2,626	16	Planning
Riley Creek-695	Parks Highway	7,713	17	Design
Klehini River-1216	Porcupine Crossing	4,521	18	Design
Nenana River-216	Parks Highway	17,898	19	Construction
Water St Viaduct-797	S. Tongass Hwy	86,316	20	Construction
Snake River-881	Nome	3,448	21	Design
Tolsona Creek-552	Glenn Highway	3,740	22	Design
Mendenhall River-737	Glacier Highway	13,392	23	Design
Gakona River-646	Tok Cutoff Hwy	5,935	24	Completed
Tanana River-505	Alaska Highway	24,516	25	Completed
Gerstle River-520	Alaska Highway	50,751	26	Planning
Phelan Creek-579	Richardson Hwy	2,126	27	Design
Peterson Creek-636	Seward Highway	4,158	28	Design
Glacier Creek-639	Seward Highway	5,510	29	Design
Portage Creek #1-630	Seward Highway	6,863	30	Design
Portage Creek #2-631	Seward Highway	8,295	31	Design
Kasilof River-670	Sterling Highway	10,067	32	Completed
Campbell Creek-972	Dowling Road	1,819	33	Design
Placer River Overflow-627	Seward Highway	11,094	35	Design
Deep Creek-668	Sterling Highway	4,778	36	Completed
Holden Creek-1520	Dalton Highway	1,184	37	Design

*DOT has implemented temporary measures to keep these bridges in service.

Bridge/Number	Route	Deck Area	Priority	Status
Salmon River-444	Gustavus Airport	4,047	38	Planning
Ninilchik River-669	Sterling Highway	5,708	39	Completed
Snow River W. Channel-603	Seward highway	6,414	40	Design
Snow River Main Channel-605	Seward Highway	22,143	41	Design
Chickaloon River-545	Glenn Highway	6,582	42	Planning
Taiya River-309	Skagway/Dyea	2,893	43	Design
Gulkana River-574	Richardson Hwy	14,212	44	Planning
O'Connor Creek-303	Goldstream Road	1,684	45	Design
Bear Creek-593	Richardson Hwy	1,318	46	Planning
Ruby Creek-594	Richardson Hwy	799	47	Design
Moose Creek-401	Petersville Road	2,184	48	Planning
Blowback Creek-1541	Tofty Road	559	49	Planning
Crooked Creek-431	Steese Highway	1,303	50	Design
Upper Miller Creek-581	Richardson Hwy	4,745	51	Planning
Castner Creek-583	Richardson Hwy	3,963	52	Planning
Anchor River-910	Old Sterling Hwy	3,744	53	Planning
Trail Creek-660	Old Tok Highway	697	54	Planning
Fish Creek-1217	Salmon River Rd	1,090	55	Design
Trollers Creek-864	Knudson Cove Rd	2,536	56	Design
Otter Creek-461	Happy Creek Rd	697	57	Planning
Archangel Creek-915	Fern Mine Road	350	58	Planning
Ninilchik River-427	Ninilchik Road	1,290	59	Design
Peters Creek-536	Old Glenn Hwy	2,798	60	Construction
Fish Camp Creek-940	Northway Road	1,267	61	Planning
S. Fork 40-Mile River-839	Taylor Highway	8,658	62	Planning
Chokosna River-1193	Edgerton Highway	2,062	63	Planning
Barbara Creek-433	Jakalof Bay Rd	1,744	64	Planning
N. Fork 12-Mile Creek-275	Steese Highway	3,794	65	Construction
American Creek #1-841	Taylor Highway	3,317	66	Planning
Mineral Creek-944	Mineral Creek Rd	1,227	67	No Project
Seattle Creek-690	Denali Highway	519	68	Planning
Rock Creek-684	Denali Highway	1,321	69	No Project
Tatalina River-462	Sterling Landing	741	70	Planning
Takotna River-463	Sterling Landing	3,596	71	Planning
Tenakee City Dock-1451	Marine Highway	3,425	72	Planning
Chena River-532	N. Hall Street	17,580	73	Design
Jack Creek-861	Nabesna Road	2,443	74	No Project
Little Tok Overflow-659	Old Tok Highway	697	75	Planning
Noyes Slough-209	Aurora Drive	3,718	76	Planning
S. Fork Anchor River-1199	North Fork Rd	1,438	77	Planning

Kroto Creek-810	Petersville Rd	3,173	78	Reconnaissance
Perryville Creek-1512	Airport Road	753	79	Reconnaissance

<u>Closed</u>

Horsetail Creek-945	Mineral Creek Rd	327 SF	1	Closed
Willow Creek-2128	Grubstake Road	794	15	Closed

Appendix C[1]

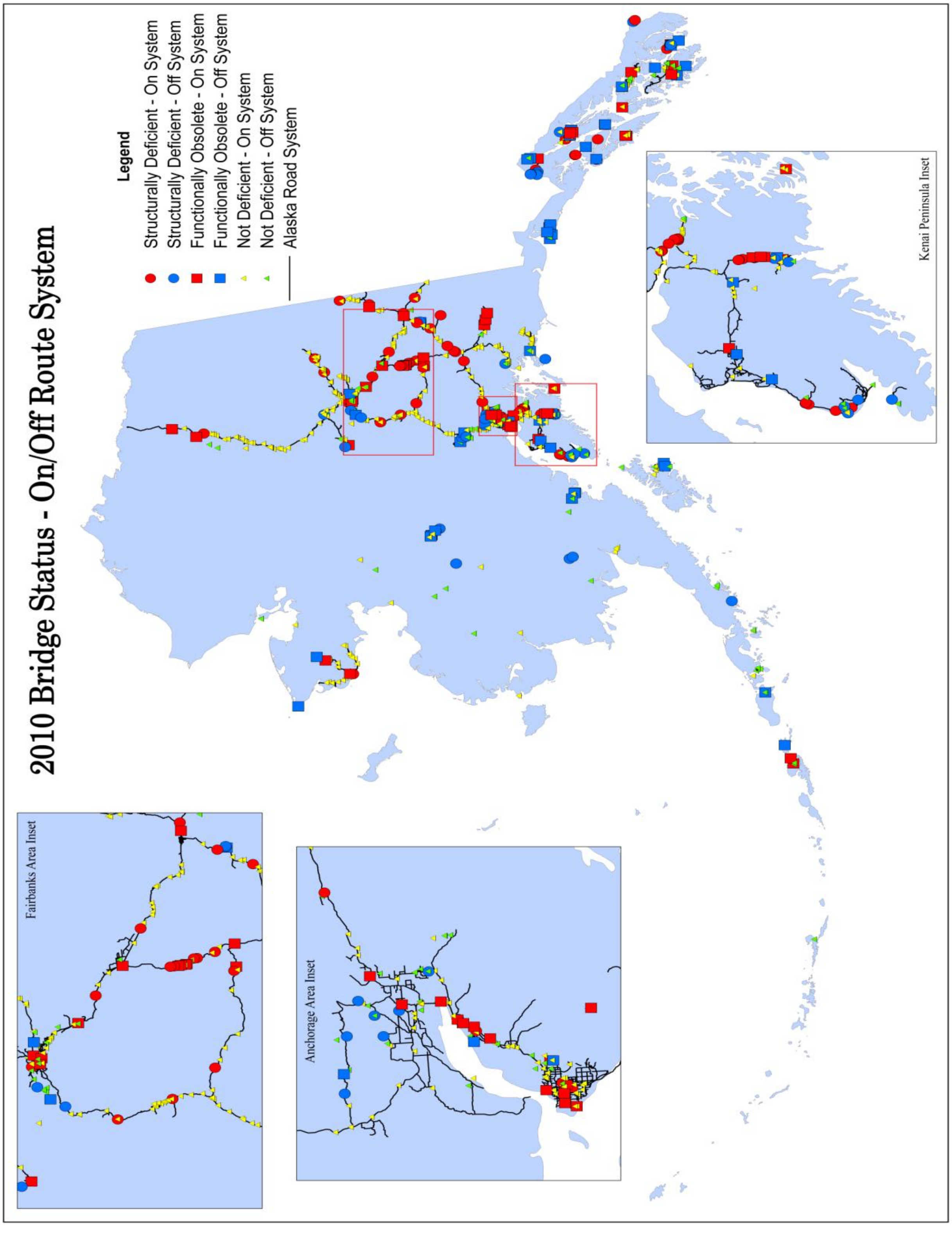
Structurally Deficient Bridges Identified for Replacement or Rehabilitation in the 2010-2013 Statewide Transportation Improvement Plan, the STIP

Water Body	Bridge Number	Fiscal Year	Work
Ketchikan Viaducts	0997, 0797	2010	Rehabilitate
Gustavus Causeway	1417	2010	Completed
Holden Creek	1520	2010	Replace
Ptarmigan Creek	0608	2011	Replace
One Mile Creek	0591	2011	Replace
Falls Creek	0609	2011	Replace
Trail River	0610	2011	Replace
Hyder Dock Trestle	1238	2011	Replace
Snake River	0881	2011	Replace
Livengood Creek	0229	2011	Replace
Tolsona Creek	0552	2011	Replace
Fish Creek	1217	2011	Rehabilitate
Fish Creek	1217	2011	Rehabilitate
Mendenhall River	0737	2012	Replace
Ninilchik River	0427	2012	Replace
No Name Creek	0327	2012	Replace

[1] This list includes only structurally deficient bridges.

Phelan Creek	0579	2012	Replace
Slana River	0654	2012	Replace
Ruby Creek	0594	2012	Replace
Tulsona River	1250	2012	Rehabilitate
Tok River	0663	2013	Replace
Placer River Overflow	0627	2013	Rehab/Replace
Placer River Main Cross	0629	2013	Rehab/Replace
Portage Creek No. 1	0630	2013	Rehab/Replace
Portage Creek No. 2	0631	2013	Rehab/Replace
Twenty-Mile River	0634	2013	Rehab/Replace
Peterson Creek	0636	2013	Rehab/Replace
Virgin Creek	0638	2013	Rehab/Replace
Glacier Creek	0639	2013	Rehab/Replace
Klehini River	1216	2013	Replace
Riley Creek	0695	2013	Replace

Appendix D: Structurally Deficient and Functionally Obsolete Bridges, On-System and Off-System



Appendix E

Status of Bridge Work on National Highway System Routes, November 30, 2010[2]

Water Body	Bridge #	Highway Route	Status
Washington Creek	#838	Elliott Highway	Completed
Tanana River	#505	Alaska Highway	Completed
Gakona River	#646	Tok Cutoff Highway	Completed
Shaw Creek	#525	Richardson Highway	Construction
Hicks Creek	#547	Glenn Highway	Completed
Susitna River	#254	Parks Highway	Completed
Tulsona Creek	#1250	Tok Cutoff Highway	Design
Tolsona Creek	#552	Glenn Highway	Design
Holden Creek	#1520	Dalton Highway	Design
Tok River	#506	Alaska Highway	Design
Moose Creek	#541	Glenn Highway	Design
Phelan Creek	#579	Richardson Highway	Design
One Mile Creek	#591	Richardson Highway	Design
Ruby Creek	#594	Richardson Highway	Design
Jarvis Creek	#595	Richardson Highway	Design
Slana River	# 654	Tok Cutoff Highway	Design
Tok River	#663	Tok Cutoff Highway	Design
Chilkat River	#742	Haines Highway	Design
Riley Creek	#695	Parks Highway	Design

[2] All bridges in the design phase are in the 2010 – 2013 STIP.